

Oils, fats and sugars

Oils (such as soy oil) and fats (such as margarine, butter, ghee) are concentrated sources of *energy*. So adding 1 teaspoon of oil or fat to a meal gives extra energy in a small volume. Red palm oil is very rich in *vitamin A*. Butter and ghee also provide *vitamin A*, and margarine usually has vitamins A and D added to it by the manufacturer.

Sugar, jaggery and honey are also energy-rich and can be added to porridge and other foods in small quantities.

Which foods and oils should be added to complementary foods in your area? Here are some questions to help you decide.

Circle the fats and oils listed below that are available in your community. Add any not listed.

Fats	Oils
margarine	soy oil
butter	coconut oil
fat from meat	sunflower oil
ghee	groundnut (peanut) oil
lard	olive oil
	coconut cream
	maize (corn) oil
	palm oil
	red palm oil
	sesame oil



butter/margarine/ghee



coconut

Of the ones you have circled:

1. *Are there any reasons why families may not give even small quantities of these foods to young children?*

.....
.....

2. *Which can be added to complementary foods during cooking?*

.....
.....

3. *Which can be added to food after cooking*

.....
.....

How complementary foods can fill the energy and nutrient gaps

What are the energy and nutrient gaps?

Earlier we explained that a young child needs the right amount of energy and nutrients to grow well and remain healthy. In Figure 1 we showed the amount of energy that children need at different ages. And we showed the amount of energy supplied by breast milk at each age. The difference between the amounts children need and the amounts from breast milk is called the *energy gap*. Figure 2 showed the *iron gap*. In the following figures we show the energy, protein, iron and vitamin A gaps for children aged 12–23 months. And we show how to fill the gaps by giving a mixture of complementary foods. The same mixtures of complementary foods also fill the gaps of the other nutrients that are not shown in the Figures, including zinc, calcium, folate and vitamin C.

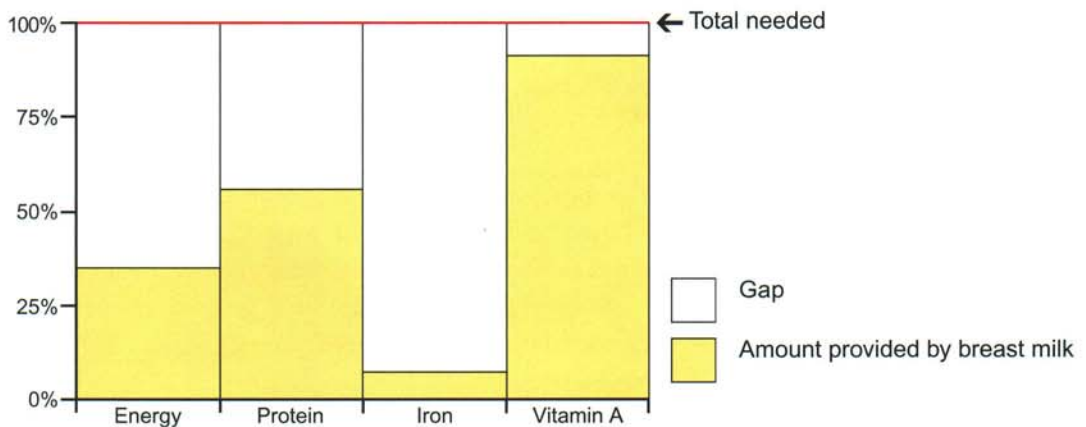


Giving a mixture of foods will help fill the energy and nutrient gaps.

In **Figure 3**, the red line at the top of each column represents how much energy, protein, iron and vitamin A are needed each day by an ‘average’ child aged 12–23 months. For simplicity we have not included other micronutrients. The lower (yellow) sections at the bottom of each column show how much energy and nutrients are supplied by breast milk if the child is breastfed frequently. Notice that:

- breast milk provides important amounts of energy and nutrients even in the second year of life
- none of the four columns is full, showing there are gaps to be filled for energy and all the nutrients
- the biggest gaps are for energy and iron, and the smallest is for vitamin A.

Figure 3 Percentage of a day's needs at 12–23 months that can be met by breast milk.



Next we want to explain how giving a *mixture of complementary foods* is the best way to fill the gaps and make certain that children get enough energy, protein and micronutrients for healthy growth and development. During a day, a good mixture is a staple + pulse + an animal food + green leaves or an orange-coloured vegetable or fruit. Families can use all these foods to make a meal, or they can use for example:

- staple + pulse + green leaves/orange vegetable or fruit at one meal
- staple + animal food + green leaves/orange vegetable or fruit at another meal.

Add a small amount of fat or oil to give extra energy if none of the other foods in the meal is energy-rich.

In the next set of figures we will use these foods to show how a mixture of them can fill the gaps between what a child needs and the nutrients provided by breast milk. For illustration, let us see what happens when we give the following foods over a day:

- frequent breastfeeds
- 3 meals: a morning meal of cereal porridge
a midday meal of rice + beans + orange
an evening meal of rice + fish (or liver) + green leaves
- 2 snacks: banana; bread with margarine.

We start with the child's midday meal as we want to show you first what happens when a child eats a staple (rice) + pulse (beans). We also want to show that foods containing vitamin C (like oranges) improve iron absorption from this meal.

Midday meal (rice + beans + orange)

First look at the top section of **Figure 4**. This shows how much of the gaps are filled when the child eats the staple in this meal. We have added a teaspoon of fat (e.g. margarine) for extra energy.

The staple cereal (3 rounded tablespoons cooked rice + 1 teaspoon fat)

- helps fill the energy and protein gaps
- has only a very small effect on the iron gap
- has no effect on the vitamin A gap.

If we had used potato or yam instead of rice, they would have a smaller effect on the protein gap. Other roots (like cassava) and starchy fruits would have almost no effect on the protein gap.

The middle section of Figure 4 shows how much of the gaps are filled by the beans in this meal.

Adding a pulse (1 rounded tablespoon of beans)

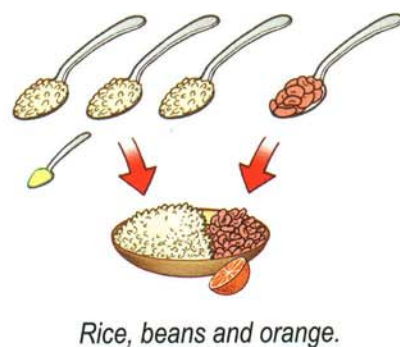
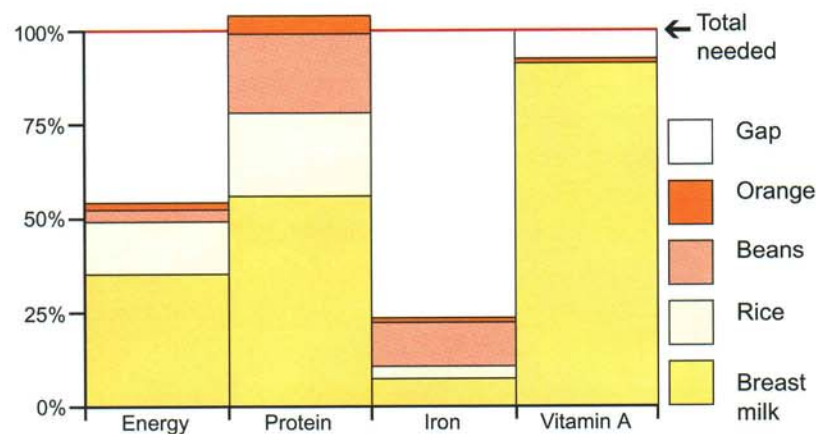
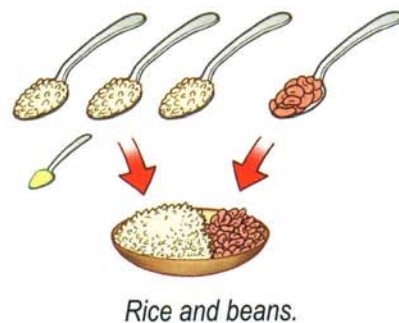
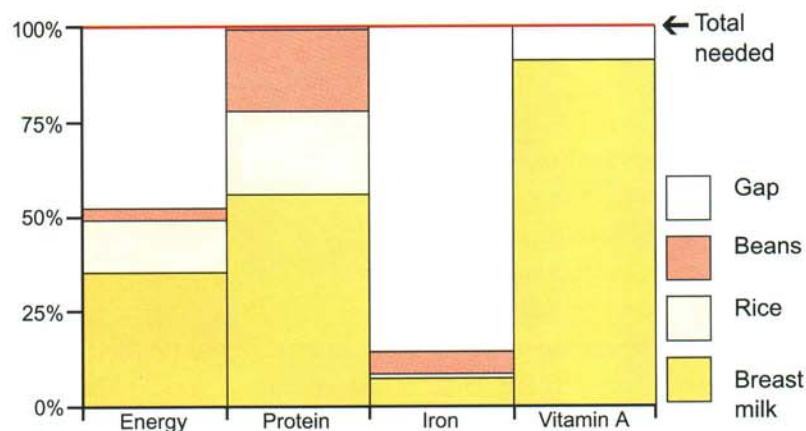
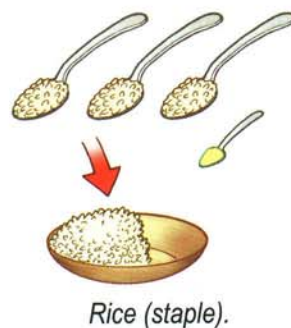
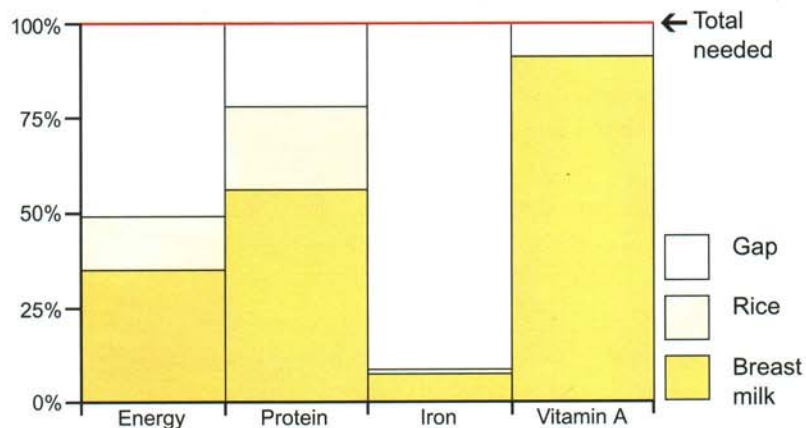
- has a small effect on the energy gap
- almost fills the protein gap
- has a small effect on the iron gap
- has no effect on the vitamin A gap.

If we had used a high-fat pulse or oil seeds, more of the energy gap would be filled.

The lower section of Figure 4 shows that fruit with the meal improves the absorption of iron from the other foods in this meal (because the fruit contains vitamin C).

*Fruit with a meal
improves the absorption
of iron*

Figure 4 Percentage of a day's needs at 12–23 months that can be met by breast milk and a midday meal of rice + beans + orange.



Adding fruit (half a small orange)

- has a small effect on the energy and protein gaps
- improves the absorption of iron in the rice and beans
- has only a small effect on the vitamin A gap.

If we had used mango, paw-paw or passion fruit instead of orange, these would have provided lots of vitamin A, as well as vitamin C.

Next let us turn to the evening meal. **Figure 5** shows how much of the gaps are filled when we combine the staple + animal food + dark-green leafy vegetable.

Evening meal (rice + fish + green leaves)

First look at the top section of Figure 5. This is the same as in the midday meal and shows how the gaps are filled by 3 tablespoons of rice and a teaspoon of fat.

The middle section of Figure 5 shows what happens to the gaps when fish is eaten with the rice.

Adding fish (1 rounded tablespoon)

- has a small effect on the energy gap
- fills the protein gap
- has a small effect on the iron gap
- has no effect on the vitamin A gap

If we had chosen small fish that are eaten *whole* with their livers, these would have filled some of the vitamin A gap. Adding fish improves the absorption of iron from the plant foods in this meal.

The lower section of Figure 5 shows what happens to the gaps with the dark-green leaves in this meal:

Adding dark-green leaves (1 rounded tablespoon)

- has very little effect on the energy gap
- provides some protein
- provides some iron
- provides lots of vitamin A and completely fills the gap.

Figure 5 Percentage of a day's needs at 12–23 months that can be met by breast milk and a evening meal of rice + fish + green leaves.

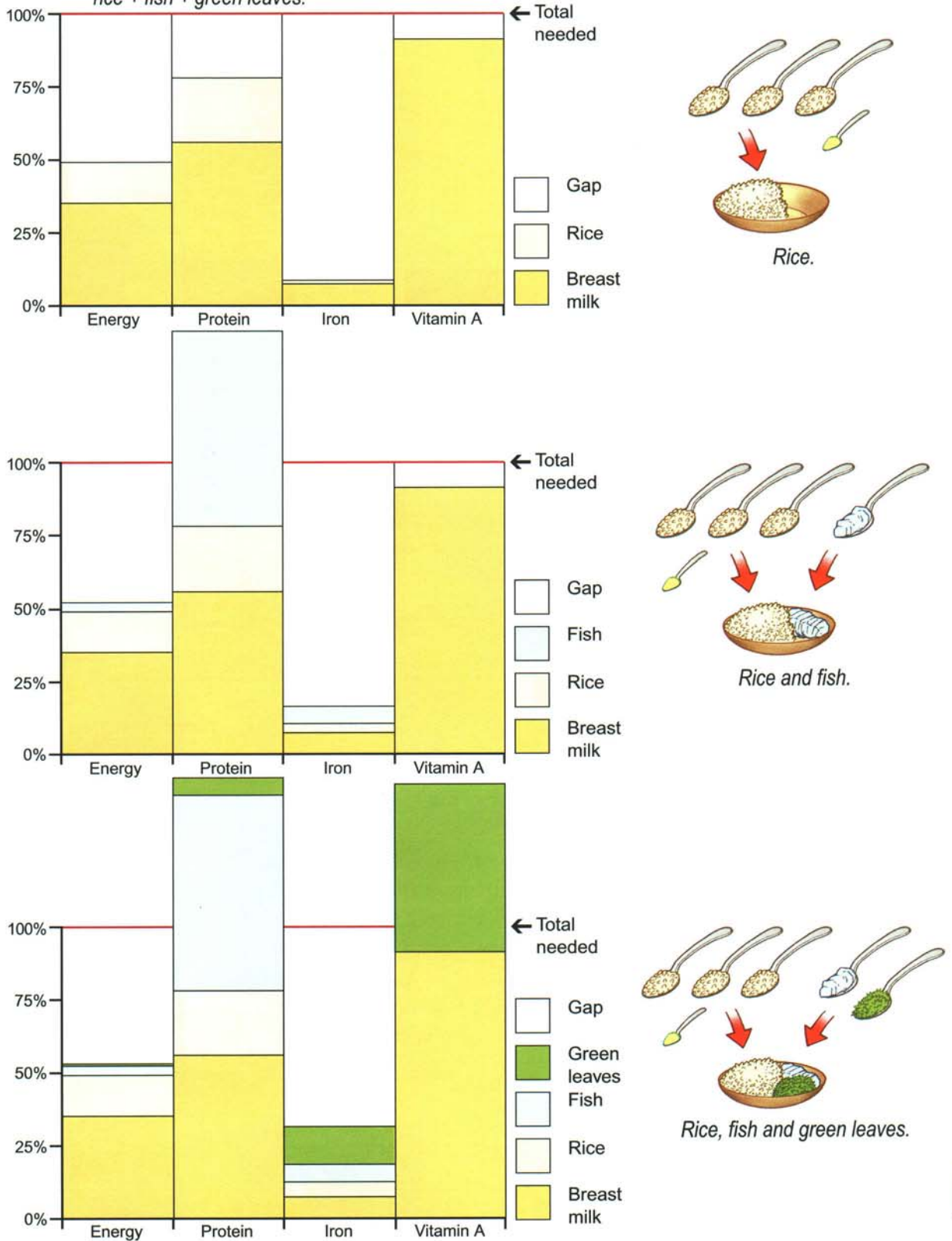


Figure 6 Percentage of a day's needs at 12–23 months that can be met by breast milk and an evening meal of rice + liver + green leaves.

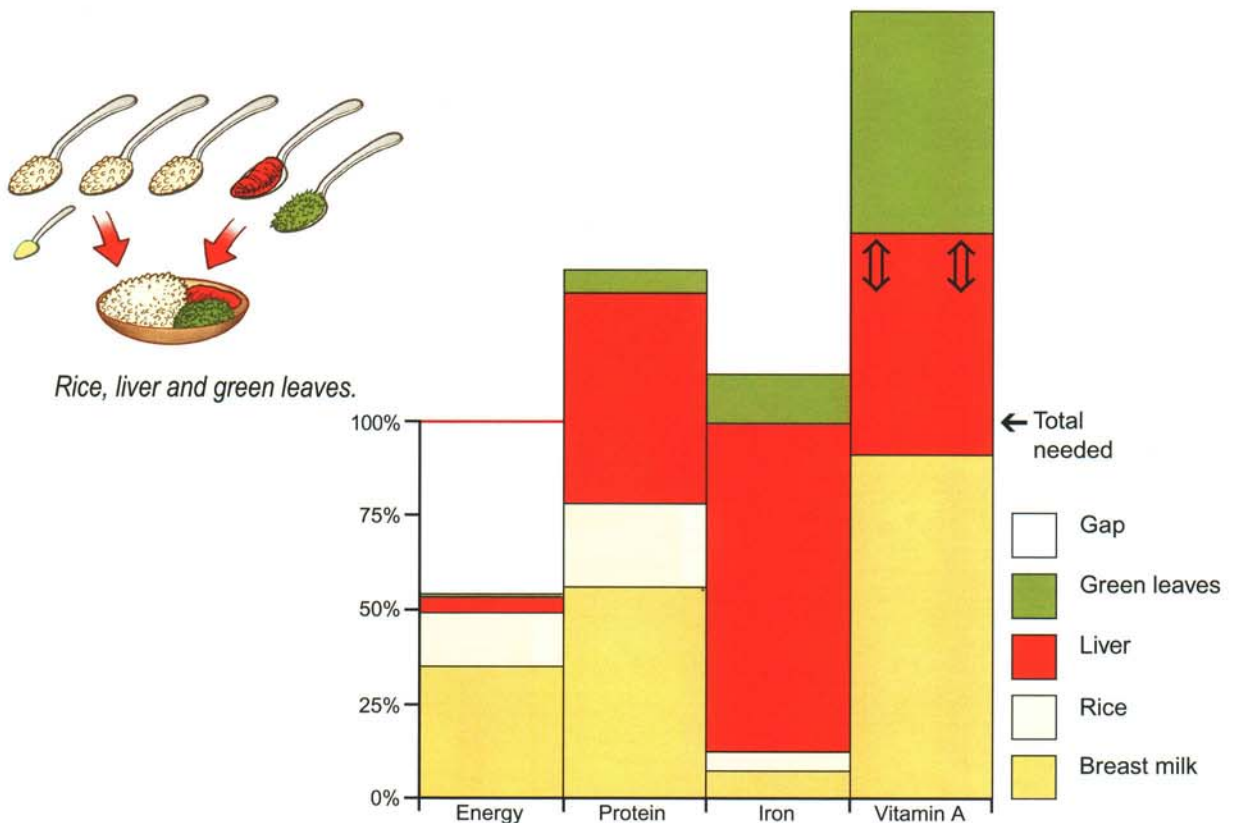
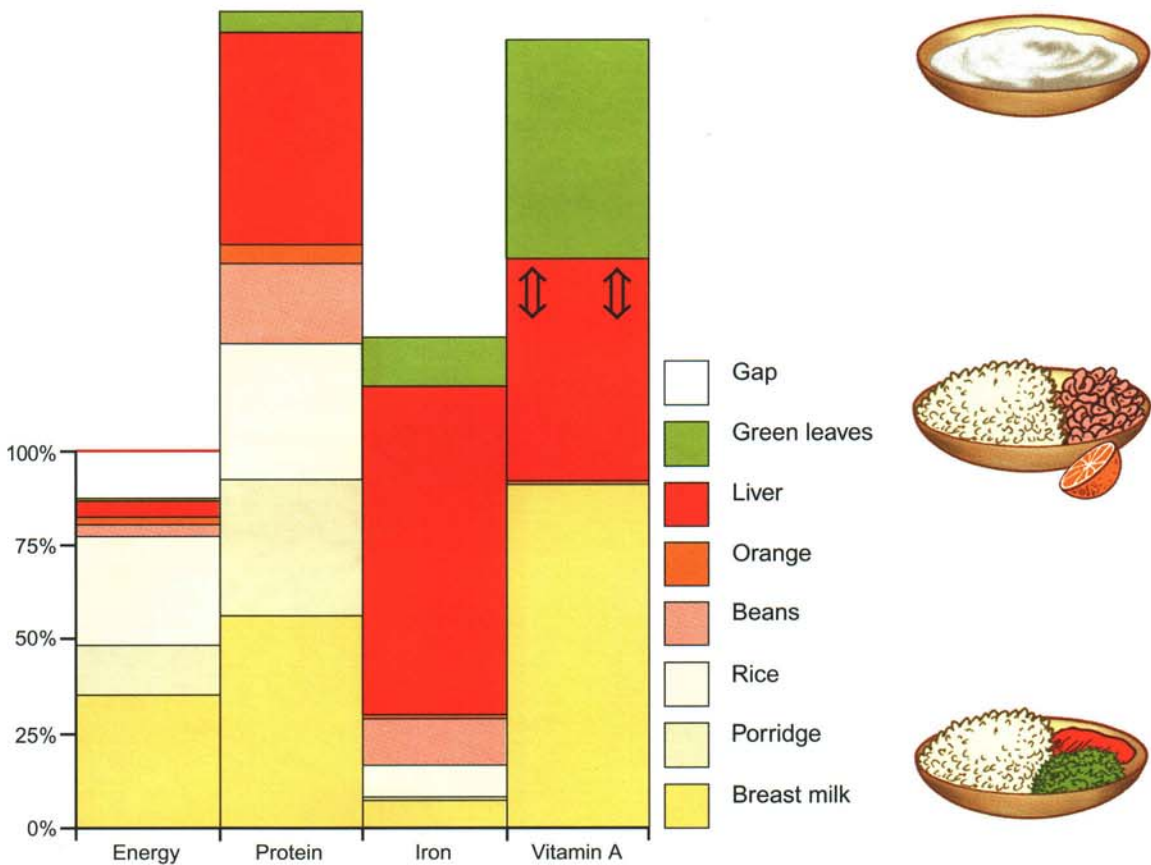


Figure 6 shows what happens to the gaps if a child eats chicken liver instead of fish:

Adding liver (1 rounded tablespoon)

- has a small effect on the energy gap
- fills the protein gap
- fills the iron gap
- fills the vitamin A gap. In fact, there is so much vitamin A that the page is too small to show it properly. It provides 20 times more than is shown here.

Figure 7 The morning meal + the midday meal + the evening meal containing liver.

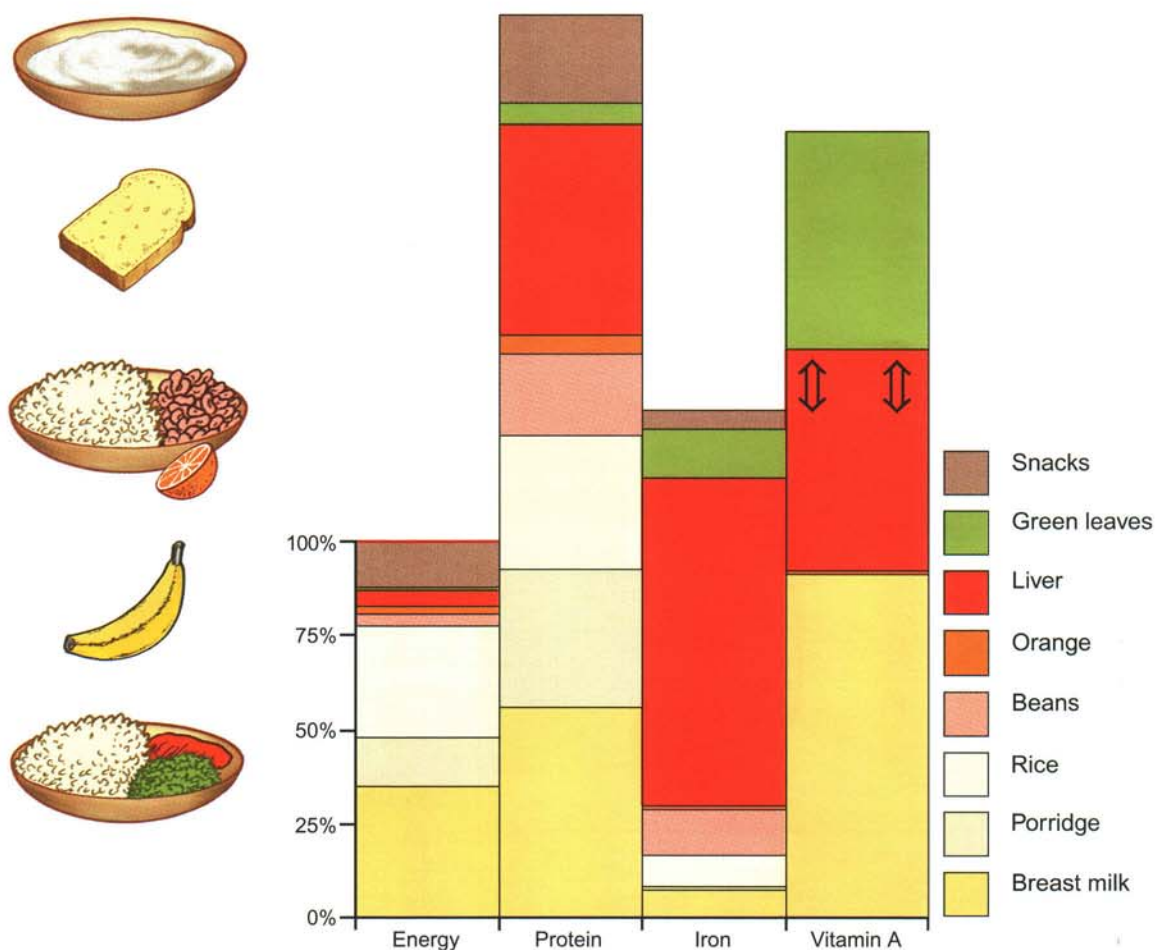


Now, let us look at Figure 7 to see what happens when a child eats the morning meal, this midday meal, and the evening meal containing liver.

Figure 7 shows that with 3 meals:

- there is still a small energy gap
- the protein gap is filled
- the iron gap is filled
- the vitamin A gap is filled.

Figure 8 The morning meal + the midday meal + the evening meal containing liver + snacks, fill all the gaps.



So let us give the child 2 snacks to fill the energy gap. **Figure 8** shows that all the gaps are filled.

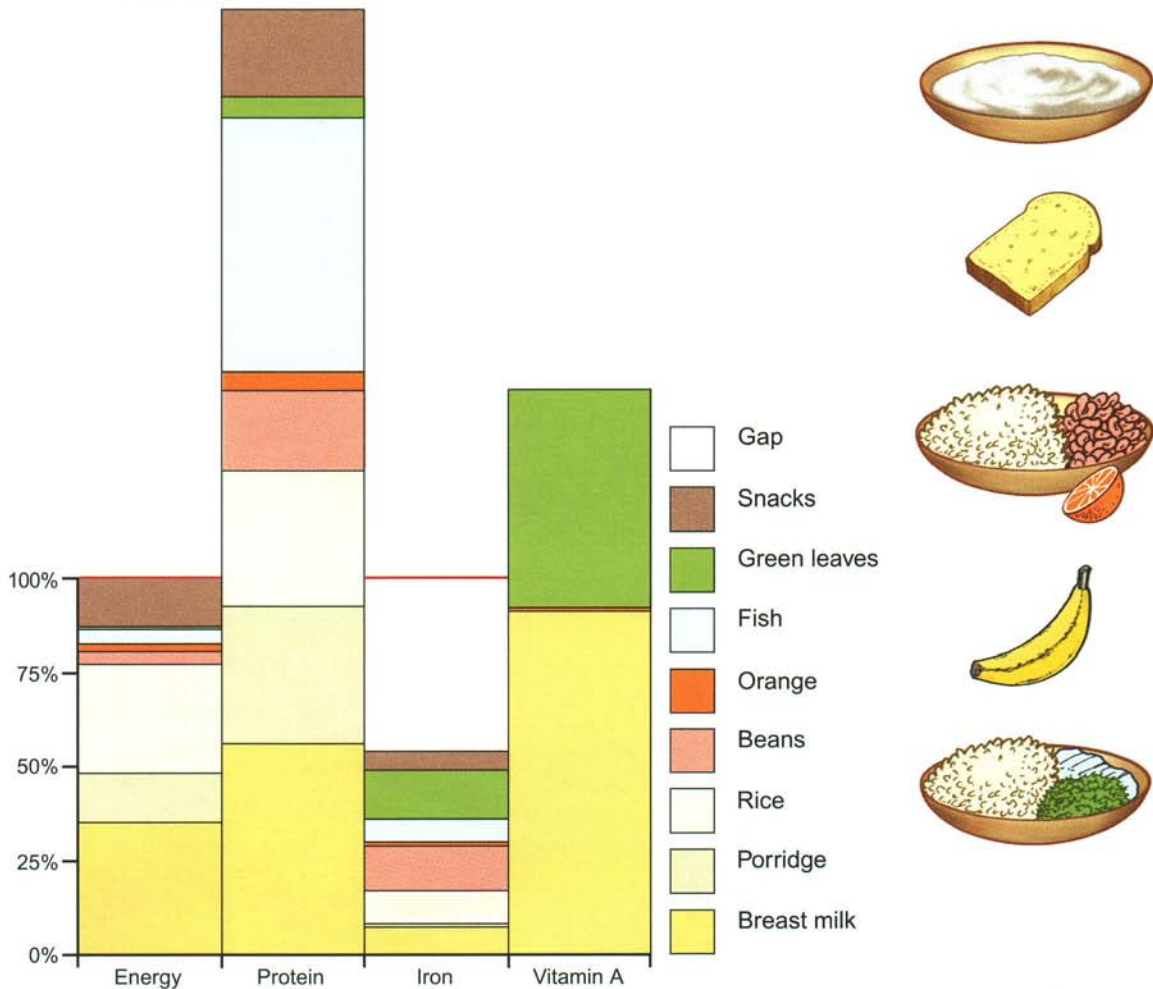
Did you notice that:

- the gap most easily filled is the protein gap
- many foods have no vitamin A at all (like rice and beans)
- a few foods provide lots of vitamin A.

Figure 8a shows what happens if the child eats fish instead of liver. The iron gap is still not filled. Iron is the most difficult gap to fill. The flesh and organs of animals and birds are the best sources of iron but are often expensive.¹

¹ Because the iron gap is difficult to fill, some health programmes recommend giving children iron supplements, either as a tablet or liquid preparation.

Figure 8a The morning meal + the midday meal + the evening meal containing fish + snacks, still leaves an iron gap.



One way to provide more iron is to give food *fortified* with iron. Examples are some cereals (rice) and cereal products (e.g. flour, bread) that have iron added to them by the manufacturer. In a few countries, milk powder, soy sauce, fish sauce, curry powder, and sugar and salt are fortified with iron.

Are iron-fortified foods available and affordable in your area? If so, encourage families to buy and use them.

Iodised salt is an important fortified food. This is salt fortified with the micronutrient iodine. Encourage families to use this if available.

Now you have seen how adding a *mixture* of complementary foods to breast milk can make a complete diet for a young child.

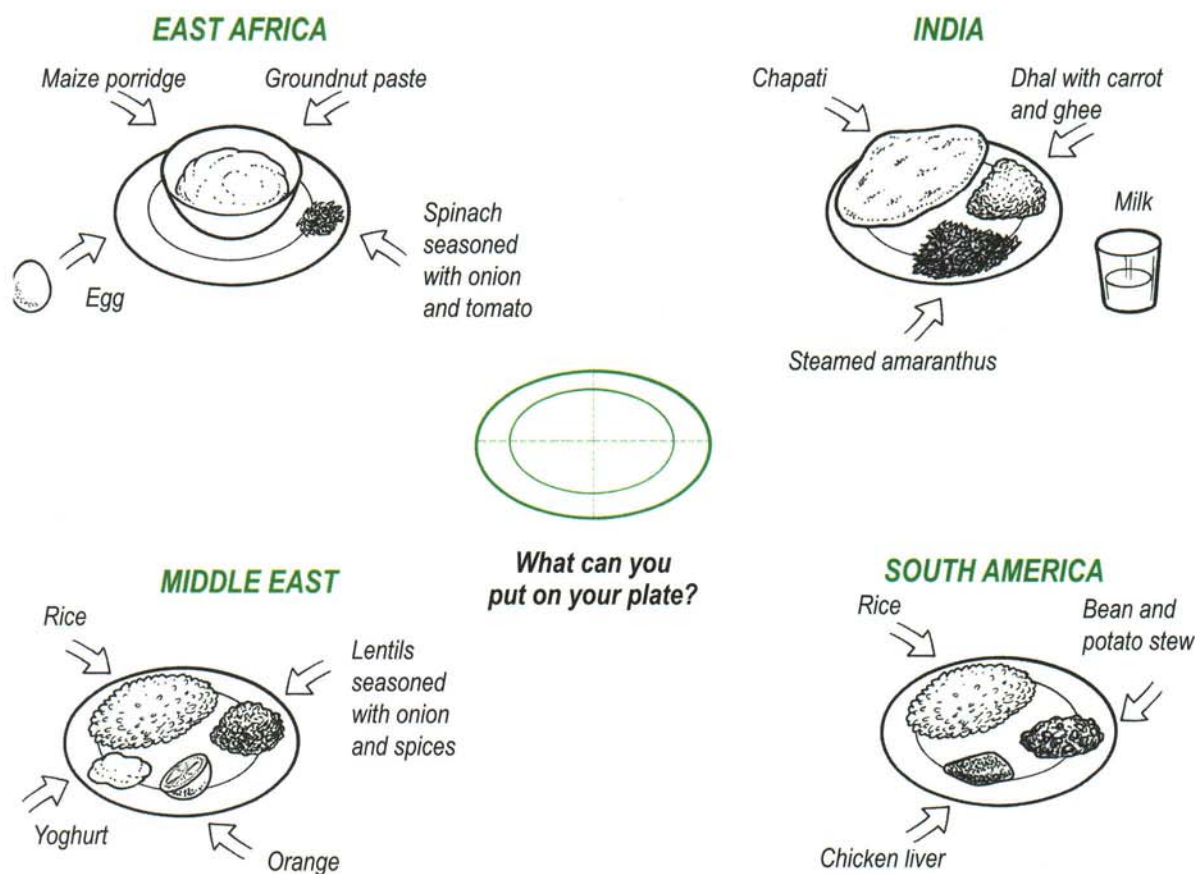
Can you help families in your area to make mixtures like these?

To help you decide, look at the foods you circled earlier and your answers to the previous questions.

1. What mixtures of local foods would children in your area like that will fill the gaps?
.....
.....
2. Which other foods do mothers usually add to meals? For example, flavouring foods such as onions and spices. We all know it is no use planning a good diet unless it is tasty and children like to eat it.....
.....

The foods used to feed children vary from place to place. In **Figure 9** below we show other mixtures of family foods that make good meals. Perhaps these will give you ideas about good mixtures of local foods. The recipes are given in Annex 2.

Figure 9 Other examples of good meals.



When you counsel a family about a child's food, you will need to suggest some options for them to consider. They will have to decide what is possible in their circumstances. So first find out if the child is being breastfed and what other foods the child is being given. Then consider if these make a good mixture that will fill the nutrient gaps. If you think there are gaps, suggest suitable foods that families might be able to give. In many places, foods from animals are difficult to obtain and expensive. For many families, it is possible to give these occasionally. Help families to think through what is really possible. Then let them decide what is best for their situation.

The meals in Figures 4–9 are enough for children aged 12–23 months. A child who is big for her age may need more. Children aged 6–11 months need less complementary food because their energy gap is smaller. But remember their iron gap is bigger, so it is especially important to include iron-rich foods for younger children.

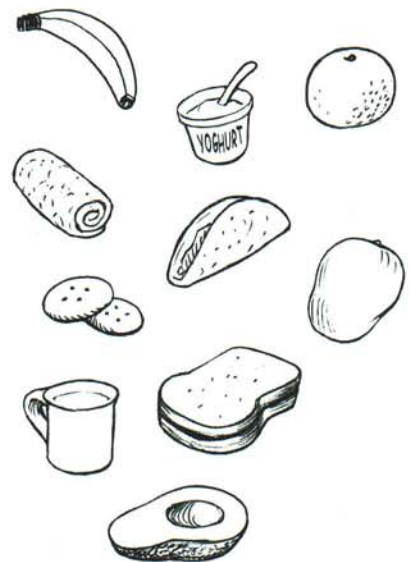
If children are not breastfed, or breastfed infrequently, they will need food of animal origin and if possible milk products to be certain to make up for the nutrients they miss from breast milk. Children less than one year old will need to be fed 5 times a day instead of only three times when they are breastfed.

Which foods make good snacks?

In Figure 8 we saw that children needed *snacks* to fill the energy gap. Snacks are foods eaten between meals. They are a convenient way to give a young child extra food. Snacks should be easy to prepare. Children should be supervised and helped to make sure the snacks are completely eaten.

Good snacks provide both energy and nutrients. Examples are:

- mashed ripe banana, paw-paw, avocado, mango and other fruits
- yoghurt, milk, puddings made with milk
- bread or chapati with butter, margarine, groundnut paste (peanut butter) or honey
- biscuits, crackers
- beancakes
- cooked potatoes.



Good snacks provide both energy and nutrients.

'Poor value' snacks are ones that are high in sugar (which rots teeth) and low in nutrients. Examples are:

- fizzy drinks (sodas)
- ice lollies/lollipops
- sweets/candies.

Questions

1. Which foods are used as snacks for young children in your area?

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.....

2. Which are of poor value?

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3. Which are good?

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4. Are there other foods that could make good snacks?

.....

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Drinks

Families should know that:

- drinks for young children must be clean and safe. So, boil water (or make it safe some other way, for example using a special filter) and boil milk if not pasteurised. Wash the outside of fruit before juicing
- drinks should not replace solid food or breast milk. If drinks are given with a meal, it is best to leave most until the end, otherwise the child may not want to eat
- teas and coffee reduce iron absorption. Drinks should not be given with a meal, or during 2 hours before a meal, or 2 hours after it.